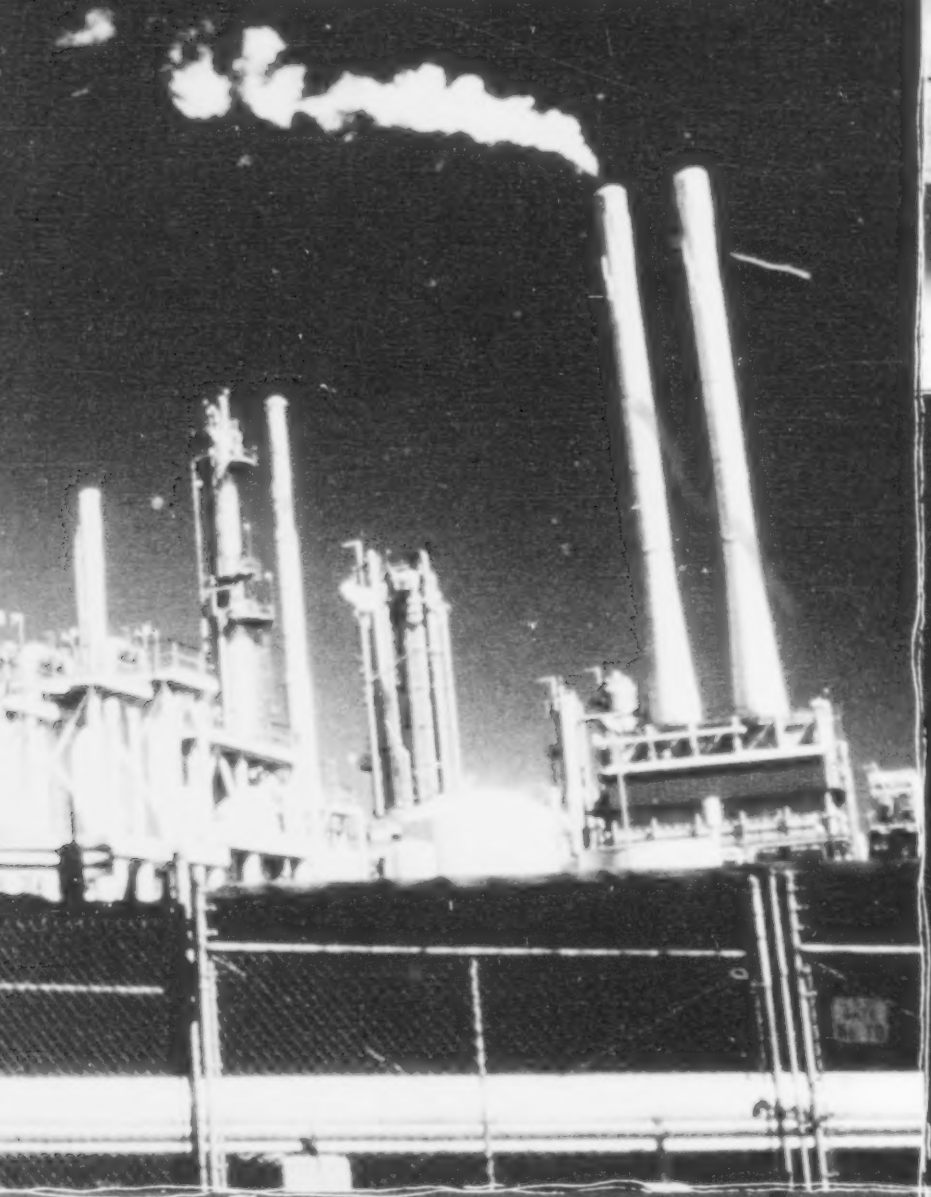
2001 National Overview —

National Pollutant Release Inventory

Canadian Environmental Protection Act, 1999



Recycling and Energy Recovery

www.ec.gc.ca/npri

November 2003

Canada

NATIONAL AND REGIONAL NPRI OFFICES

National Office
National Pollutant Release Inventory
Environment Canada
9th Floor, Place Vincent Massey
351 St. Joseph Blvd.
Gatineau, QC
K1A 0H3
Tel.: (819) 953-1656
Fax: (819) 994-3266
E-mail: NPRI@ec.gc.ca
General Inquiries: 1 800 668-6767

Newfoundland and Labrador, Prince Edward Island, New Brunswick and Nova Scotia
National Pollutant Release Inventory
Environment Canada
16th Floor, Queen Square
45 Alderney Drive
Dartmouth, NS
B2Y 2N6
Tel.: (902) 426-4482 / 426-4805 / 426-5037
Fax: (902) 490-0722
E-mail: NPRI_ATL@ec.gc.ca

Quebec
National Pollutant Release Inventory
Environment Canada
105 McGill Street, 4th Floor
Montreal, QC
H2Y 2E7
Tel.: (514) 283-7303 / 283-0248 / 496-1832
Fax: (514) 496-6982
E-mail: INRP_QC@ec.gc.ca

Ontario
National Pollutant Release Inventory
Environment Canada
4905 Dufferin Street, 2nd Floor
Downsview, ON
M3H 5T4
Tel.: (416) 739-5955
Fax: (416) 739-4326
E-mail: NPRI_ONTARIO@ec.gc.ca

NPRI/Ontario Regulation 127
Joint Technical Assistance Centre
Tel.: (416) 739-4707

Manitoba, Saskatchewan, Alberta, Northwest Territories and Nunavut
National Pollutant Release Inventory
Environment Canada
Twin Atria #2, Room 200
4999-98 Avenue
Edmonton, AB
T6B 2X3
Tel.: (780) 951-8989
Fax: (780) 951-8808 / 495-2615
E-mail: NPRI_PNR@ec.gc.ca

British Columbia and Yukon
National Pollutant Release Inventory
Environment Canada
#201–401 Burrard Street
Vancouver, BC
V6C 3S5
Tel.: (604) 666-3221 / 666-3890 / 666-9864
Fax: (604) 666-6800
E-mail: NPRI_PYR@ec.gc.ca

National Pollutant Release Inventory
Environment Canada
91782 Alaska Highway
Whitehorse, YT
Y1A 5B7
Tel.: (867) 667-3402
Fax: (867) 667-7962
E-mail: NPRI_YK@ec.gc.ca

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National Overview —

National Pollutant Release Inventory

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Prepared by:
National Pollutant Release Inventory (NPRI), National Office
Information Systems Division, Pollution Data Branch, Environment Canada

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1 OVERVIEW OF THE NPRI

1.1 What Is the NPRI?

The National Pollutant Release Inventory (NPRI) is a legislated, nationwide, publicly accessible inventory of pollutants released to the environment. It was created in 1992 to provide Canadians with information on pollutant releases from facilities located in their communities, including the quantities discharged to air, water, land, and underground injection and the quantities sent to other facilities for disposal, treatment, or recycling and energy recovery. It also supports a number of environmental initiatives, by providing information that:

- helps governments and others to identify priorities for action;
- encourages industry to take proactive measures to reduce releases;
- allows for tracking of progress in reducing releases; and
- supports a number of regulatory initiatives.

The NPRI is a constantly evolving program. Public and stakeholder consultation is an integral part of the changes to the program. Since the NPRI's inception, substances have been added and deleted, the thresholds at which substances are reported have been adjusted, and the NPRI has expanded in scope to collect data on recycling and pollution prevention activities. Further refinements are planned for future years.

The NPRI program is delivered by Environment Canada under the authority of the *Canadian Environmental Protection Act* (CEPA).[1] Owners or operators of facilities that manufacture, process, or otherwise use one or more of the NPRI-listed substances under prescribed conditions are required to submit an annual report to Environment Canada on the releases and transfers of those substances.[2]

For more information, refer to Environment Canada's NPRI Web site at **www.ec.gc.ca/npri/**, or contact your nearest NPRI office.

1.2 What's New for the 2001 NPRI?

1.2.1 NPRI Substance List for 2001

The NPRI changed significantly for the 2000 reporting year with the introduction of alternate reporting thresholds. Certain substances are listed at alternate thresholds because they pose serious risks to human health or the environment in relatively low quantities, and very limited data, if any, would be reported to the NPRI for these substances at the original 10-tonne and 1% concentration reporting threshold. Substances with alternate reporting thresholds in the 2001 NPRI include mercury (and its compounds), 17 polycyclic aromatic hydrocarbons (PAHs), dioxins/furans, and hexachlorobenzene (HCB).

The following changes were made to the NPRI substance list for the 2001 reporting year:

- addition of N,N-dimethylformamide (CAS No. 68-12-2) to Schedule 1, Part I, of the 2001 *Canada Gazette* notice;
- amalgamation of the individual isomers of cresol (*m*-, *o*-, and *p*-cresol) under the "cresol (all isomers)" listing;
- changed qualifier for vanadium to "(except when in an alloy) and its compounds" from "fume or dust"; and
- de-listing of phosphoric acid (CAS No. 7664-38-2).

The list of NPRI substances for the 2001 reporting year is provided in a supplementary table found on the NPRI Web site at **www.ec.gc.ca/npri/**

1.2.2 2001 National Overview Series

The 2001 National Pollutant Release Inventory (NPRI) National Overview (referred to as the "2001 National Overview") consists of the following series of documents:

- 2001 National Overview — Reporting Requirements, National Pollutant Release Inventory;
- 2001 National Overview — Summary of 2001 Data, National Pollutant Release Inventory;

1 The 1988 CEPA was in force for previous years of NPRI reporting. CEPA 1999 came into force in April 2000 and is the authority for the 2001 reporting year and beyond.

2 The requirements for the 2001 NPRI were published in the *Canada Gazette*, Part I, on December 29, 2001.

- 2001 National Overview — Releases, National Pollutant Release Inventory;
- 2001 National Overview — Final Disposal and Off-site Transfers for Treatment Prior to Final Disposal, National Pollutant Release Inventory; and
- 2001 National Overview — Recycling and Energy Recovery, National Pollutant Release Inventory.

The 2001 National Overview was categorized in this manner to provide Canadians with more focused and concise summaries regarding the NPRI reporting requirements, on-site releases of pollutants, final disposal of pollutants and off-site transfer of pollutants for treatment prior to final disposal, and information on recycling and energy recovery in Canada for the 2001 reporting year. The 2001 National Overview series includes data as they appeared in the NPRI database on **November 8, 2002**.

In addition to the 2001 National Overview series, Environment Canada has developed a new report entitled *Informing Canadians on Pollution 2003: Highlights of the 2001 National Pollutant Release Inventory (NPRI)*. This report provides a snapshot of pollution from industrial and commercial companies in Canada in 2001. In addition to marking progress on sector and pollutant releases and disposal and recycling trends, other highlights include special sections on toxic substances, pollution prevention, managing pollution in Canada, and tips on how communities and individuals can use the NPRI.

1.2.3 New Groupings for Releases and Transfers

Environment Canada engaged stakeholders during 2002 to review the "reporting in" and "reporting out" of NPRI information. This review was identified as a priority during the consultation process by the NPRI Multistakeholder Work Group on Substances. In previous reporting years, some stakeholders expressed concerns with the reporting of pollutants sent to a landfill on site as a release to the environment, whereas transfers off site of pollutants for final disposal to a landfill were reported as transfers. This difference in classification could lead to a different representation of the same activity, depending on whether it occurred on site or off site. There is also an issue of perception — sending substances to a landfill is perceived differently from releases to air and water.

Stakeholders have recommended that releases include only releases to air and water and those releases that disperse material on land. Substances sent to landfill or land farm or underground injection on site should be grouped together with transfers off site destined for a similar fate. Other options are possible, but the recommended option has a number of advantages, including the following:

- Similar activities are portrayed in a similar manner, whether they occur on site or off-site.
- It will be easier to track trends in disposal.
- It provides a more intuitive presentation of information.

Through this work with stakeholders, a new format was established for summarizing releases and transfers of NPRI pollutants. The following groupings were used to summarize information collected through the NPRI for the 2001 reporting year:

On-site pollutant releases:

- air
- water
- land — includes spills, leaks, and other

Final disposal:

- on-site disposal: landfill, land treatment, and underground injection
- off-site disposal: landfill, land treatment, underground injection, and storage

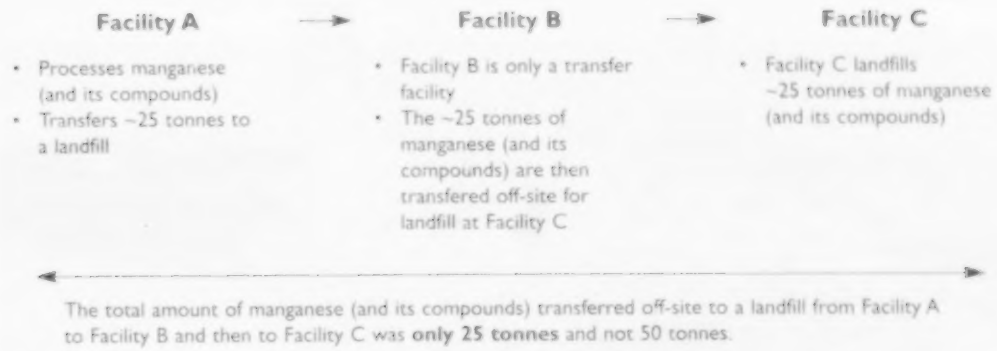
Off-site transfers for treatment prior to final disposal:

- physical treatment
- chemical treatment
- biological treatment
- incineration or thermal treatment where energy is not recovered
- treatment at a municipal sewage treatment plant (MSTP)

Off-site transfers for recycling and energy recovery:

- recycling
- energy recovery

Figure 1-1 Example of Double Counting


Facility A
• Processes manganese (and its compounds)
• Transfers ~25 tonnes to a landfill
Facility B
• Facility B is only a transfer facility
• The ~25 tonnes of manganese (and its compounds) are then transfered off-site for landfill at Facility C
Facility C
• Facility C landfills ~25 tonnes of manganese (and its compounds)
The total amount of manganese (and its compounds) transferred off-site to a landfill from Facility A to Facility B and then to Facility C was **only 25 tonnes** and not 50 tonnes.

Appendix A provides NPRI definitions for releases and transfers.

Double counting is an issue that needs to be considered when attempting to add releases and transfers together. It is important to understand that there is no double counting of releases and disposal on site, whereas transfers may be counted more than once. In Figure 1-1, for example, Facility A transfers approximately 25 tonnes of manganese (and its compounds) (deemed to be a waste material by Facility A) to Facility B (a transfer facility). Facility B then transfers the same 25 tonnes of manganese (and its compounds) to Facility C, which proceeds to landfill this material. In addition, Facility A, Facility B, and Facility C file reports to NPRI for the 2001 reporting year. In this example, it is important to note that **only 25 tonnes** (and not 50 tonnes) of manganese (and its compounds) in total are transferred off site from Facility A to Facility B and then to Facility C.

2 OFF-SITE TRANSFERS FOR RECYCLING AND ENERGY RECOVERY IN 2001

In 2001, 2618 facilities reported to the NPRI, of which 857 submitted data on off-site transfers for recycling and energy recovery totalling an estimated 1 126 461 tonnes, a decrease of 3911 tonnes (or -0.3%) from 2000. The following breakdown summarizes off-site recycling and energy recovery activities in 2001 (see Table 2-1 and Figure 2-1):

- other recovery, reuse, and recycling activities — 909 680 tonnes (80.8% of national total);
- metals and metal compounds — 114 704 tonnes (10.2%);
- acids or bases — 63 617 tonnes (5.6%);
- solvents — 11 570 tonnes (1.0%);
- catalysts — 11 086 tonnes (1.0%);
- energy recovery — 8598 tonnes (0.8%);
- organic substances — 3832 tonnes (0.3%);
- inorganic materials — 2339 tonnes (0.2%);
- pollution abatement residues — 957 tonnes (0.1%); and
- used oil — 77 tonnes (<0.1%).

Table 2-1 National Summary of Off-site Transfers for Recycling and Energy Recovery in 2001 [A]

	2000	2001	Change (2000–2001)	% change (2000–2001)
Total facilities	824	857	33	4.0
Total reports	2 368	2 490	122	5.2
Pollutants reported	104	102	-2	-1.9
Off-site transfers for recycling and energy recovery (tonnes):				
Recycling	1 114 031.4	1 117 863.1	3 831.7	0.3
Energy recovery	16 340.6	8 597.5	-7 743.1	-47.4
Total off-site transfers for recycling and energy recovery	**1 130 372.0**	**1 126 460.6**	**-3 911.4**	**-0.3**

[A] Because of rounding of release and transfer quantities, the totals may not equal the sum of the individual values.

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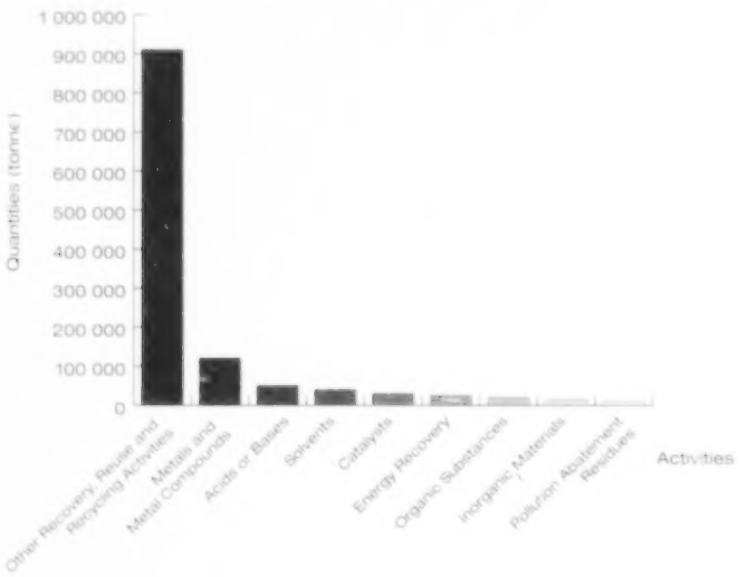

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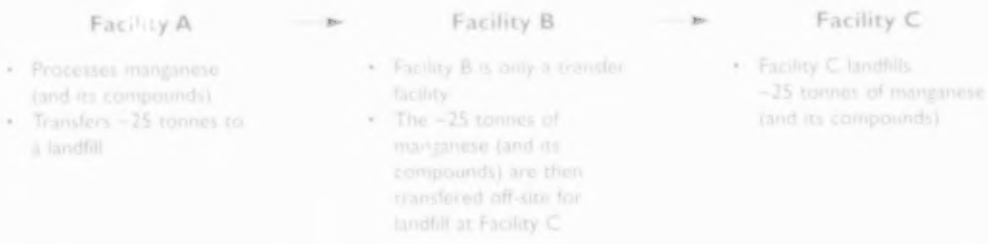
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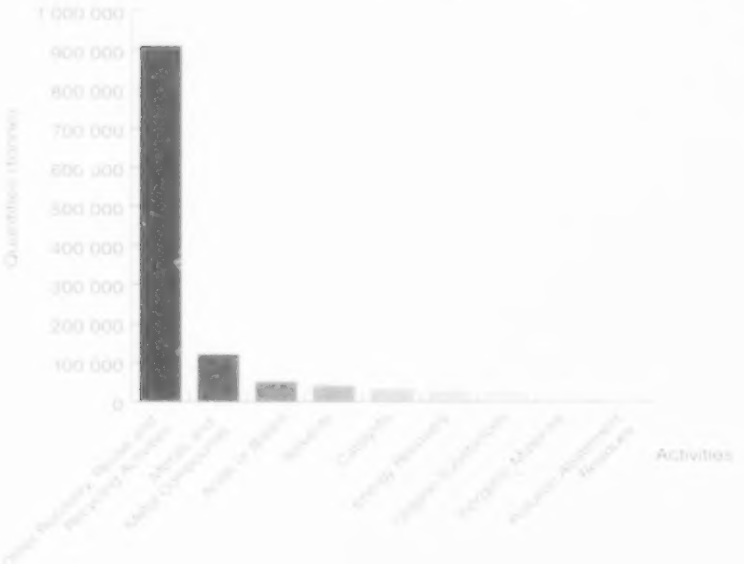

3 TWENTY-FIVE NPRI POLLUTANTS TRANSFERRED OFF-SITE FOR RECYCLING AND ENERGY RECOVERY IN THE LARGEST QUANTITIES IN 2001

Table 3-1 provides a summary of the 25 NPRI-listed substances transferred off site in the largest quantities for recycling and energy recovery in 2001. The following six substances accounted for an estimated 1 077 306 tonnes (95.6% of the total):

- hydrogen sulphide — 900 794 tonnes (80.0% of the national total);
- sulphuric acid — 75 753 tonnes (6.7%);
- copper (and its compounds) — 38 742 tonnes (3.4%);
- zinc (and its compounds) — 38 228 tonnes (3.4%);
- chromium (and its compounds) — 12 035 tonnes (1.1%); and
- manganese (and its compounds) — 11 753 tonnes (1.0%).

As noted above, an estimated 900 794 tonnes (80.0% of the national total) of hydrogen sulphide were transferred off site in the largest quantities for recycling — "other" in 2001. This total quantity was attributed to an off-site transfer for recycling by facilities in the Support Activities for Mining and Oil and Gas Extraction industrial sector. In 2000, this sector reported an estimated 928 928 tonnes of hydrogen sulphide as a transfer off site for recycling. This resulted in a decrease of an estimated 28 134 tonnes (or -3.0%) from 2000.

Sulphuric acid (75 753 tonnes) was the second ranked substance that was transferred off site in the largest quantity for recycling in 2001 — an increase of an estimated 34 572 tonnes (or +84.0%) from 2000. This was mainly attributed to facilities in the Petroleum and Coal Products Manufacturing industrial sector, which reported an estimate of 66 078 tonnes in 2001 — an increase of 37 416 tonnes (or +130.5%) from 2000. The recycling of sulphuric acid from this sector in 2001 can be further broken down as follows:

- 10 448 tonnes as an off-site transfer for recycling — recovery of inorganic materials; and
- 55 630 tonnes as an off-site transfer for recycling — recovery of catalysts.

It is important to note that increases and decreases in off-site transfers for recycling and energy recovery can be attributed to numerous factors (these factors should be considered when using NPRI information), including, but not limited to, the following:

- facilities reporting to the NPRI for the first time;
- facilities using improved estimation methodologies;
- changes in facility infrastructure and processes/operations; and
- use of pollution prevention techniques.

Table 3-1 Twenty-five NPRI Pollutants Transferred Off Site in the Largest Quantities for Recycling and Energy Recovery in 2001

		Off-site Transfers for Recycling and Energy Recovery (tonnes)												
CAS No.	Pollutant	Energy Recovery	Solvents	Organics	Metals	Inorganics	Acids or bases	Catalysts	Abate-ment Residues	Used Oil	Other	2000 Total	2001 Total	Change 2000–2001)	% change 2000–2001)
7783-06-4	Hydrogen sulphide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	900 794.0	900 794.2	928 928.5	-28 134.3	-3.0
7664-93-9	Sulphuric acid	0.0	0.0	0.0	178.4	0.1	6 3345.7	10 448.0	0.0	0.0	1 781.0	75 753.2	41 181.1	34 572.0	84.0
NA	Copper (and its compounds)	0.7	0.0	0.0	36 795.1	372.2	0.0	0.0	24.7	0.0	1 549.1	38 741.9	36 599.5	2 142.4	5.9
NA	Zinc (and its compounds)	51.2	0.0	10.9	35 466.9	835.2	0.0	11.4	520.1	1.3	1 281.1	38 228.2	35 594.9	2 633.4	7.4
NA	Chromium (and its compounds)	0.0	0.0	5.9	11 703.0	47.7	0.0	0.0	6.2	0.0	272.5	12 035.4	7 544.9	4 490.5	59.5
NA	Manganese (and its compounds)	2.4	0.0	27.2	10 484.1	502.5	0.0	0.0	97.8	0.0	639.2	11 753.3	13 673.8	-1 920.5	-14.0
NA	Lead (and its compounds)	6.1	0.0	0.0	9 656.6	9.5	0.0	0.0	9.7	0.0	135.5	9 817.4	13 708.6	-3 891.2	-28.4
1330-20-7	Xylene (mixed isomers)	2 960.8	4 013.5	40.2	0.0	0.0	0.0	0.0	0.0	0.4	34.4	7 049.3	11 989.7	-4 940.3	-41.2
NA	Nickel (and its compounds)	77.0	0.0	5.8	4 655.9	4.6	0.0	204.1	5.4	0.0	141.2	5 094.0	4 766.2	327.8	6.9
108-88-3	Toluene	2 316.6	2 631.8	20.3	0.0	0.0	0.0	0.0	0.0	0.1	29.5	4 998.3	7 840.6	-2 842.3	-36.3
7429-90-5	Aluminum (fume or dust)	0.0	0.0	0.0	3 133.1	0.0	0.0	0.0	0.0	0.0	319.4	3 452.5	2 836.3	616.2	21.7
107-21-1	Ethylene glycol	134.2	23.2	2 966.9	0.0	0.2	0.0	0.0	0.0	0.6	232.6	3 357.6	7 229.9	-3 872.3	-53.6
78-93-3	Methyl ethyl ketone	797.2	2 419.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.8	3 217.2	4 100.5	-883.3	-21.5
7647-01-0	Hydrochloric acid	0.0	0.0	0.0	0.0	59.6	244.1	0.0	0.0	0.0	929.9	1 233.6	1 365.3	-131.8	-9.7
NA	Ammonia (total)	0.0	0.0	0.0	6.7	148.7	0.0	14.7	161.8	0.0	831.0	1 163.0	1 345.7	-182.7	-13.6
7440-62-2	Vanadium (and its compounds)	0.0	0.0	1.4	840.1	115.2	0.0	1.6	13.3	0.0	148.3	1 119.9	683.4	436.6	63.9
67-56-1	Methanol	544.6	360.5	107.2	0.0	0.0	0.0	0.0	0.0	0.7	12.7	1 025.8	867.4	158.3	18.3
67-63-0	Isopropyl alcohol	309.9	482.4	11.3	0.0	0.0	0.0	0.0	0.0	0.0	7.6	811.1	1 372.5	-561.4	-40.9
108-10-1	Methyl isobutyl ketone	157.4	468.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	630.0	1 105.0	-475.0	-43.0
100-41-4	Ethylbenzene	270.5	354.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	3.4	629.6	818.1	-188.4	-23.0
1313-27-5	Molybdenum trioxide	0.0	0.0	0.0	245.4	2.6	0.0	323.4	0.0	0.0	0.0	571.4	794.6	-223.3	-28.1
108-95-2	Phenol (and its salts)	0.0	0.0	478.9	0.0	0.0	21.4	0.0	0.0	0.0	9.2	509.6	391.5	118.1	30.2
NA	Arsenic (and its compounds)	0.0	0.0	0.0	430.3	51.4	0.0	0.0	2.0	0.0	12.6	496.2	485.5	10.7	2.2
NA	Antimony (and its compounds)	0.0	0.0	0.0	372.8	1.1	0.0	0.0	0.0	0.0	38.7	412.6	244.7	168.0	68.6
71-36-3	n-Butyl alcohol	193.3	178.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	372.4	392.0	-19.6	-5.0
Largest on-site releases		**7 821.8**	**10 932.2**	**3 677.3**	**113 968.4**	**2 200.8**	**6 3611.2**	**11 003.2**	**841.4**	**3.1**	**909 208.4**	**1 123 267.8**	**1 125 860.3**	**-2 592.6**	**-0.2**
National total		**8 597.5**	**11 570.0**	**3 832.0**	**114 704.4**	**2 339.3**	**6 3617.0**	**11 086.5**	**957.0**	**76.8**	**909 680.1**	**1 126 460.6**	**1 130 372.0**	**-3 911.4**	**-0.3**
% of national total		**91.0**	**94.5**	**96.0**	**99.4**	**94.1**	**100.0**	**99.2**	**87.9**	**4.0**	**99.9**	**99.7**	**99.6**	**0.1**	**0.1**

3 TWENTY-FIVE NPRI POLLUTANTS TRANSFERRED OFF-SITE FOR RECYCLING AND ENERGY RECOVERY IN THE LARGEST QUANTITIES IN 2001

Table 3-1 provides a summary of the 25 NPRI-listed substances transferred off site in the largest quantities for recycling and energy recovery in 2001. The following six substances accounted for an estimated 1 077 306 tonnes (95.6% of the total):

- hydrogen sulphide — 900 794 tonnes (80.0% of the national total);
- sulphuric acid — 75 753 tonnes (6.7%);
- copper (and its compounds) — 38 742 tonnes (3.4%);
- zinc (and its compounds) — 38 228 tonnes (3.4%);
- chromium (and its compounds) — 12 035 tonnes (1.1%); and
- manganese (and its compounds) — 11 753 tonnes (1.0%).

As noted above, an estimated 900 794 tonnes (80.0% of the national total) of hydrogen sulphide were transferred off site in the largest quantities for recycling — "other" in 2001. This total quantity was attributed to an off-site transfer for recycling by facilities in the Support Activities for Mining and Oil and Gas Extraction industrial sector. In 2000, this sector reported an estimated 928 928 tonnes of hydrogen sulphide as a transfer off site for recycling. This resulted in a decrease of an estimated 28 134 tonnes (or -3.0%) from 2000.

Sulphuric acid (75 753 tonnes) was the second ranked substance that was transferred off site in the largest quantity for recycling in 2001 — an increase of an estimated 34 572 tonnes (or +84.0%) from 2000. This was mainly attributed to facilities in the Petroleum and Coal Products Manufacturing industrial sector, which reported an estimate of 66 078 tonnes in 2001 — an increase of 37 416 tonnes (or +130.5%) from 2000. The recycling of sulphuric acid from this sector in 2001 can be further broken down as follows:

- 10 448 tonnes as an off-site transfer for recycling — recovery of inorganic materials; and
- 55 630 tonnes as an off-site transfer for recycling — recovery of catalysts.

It is important to note that increases and decreases in off-site transfers for recycling and energy recovery can be attributed to numerous factors (these factors should be considered when using NPRI information), including, but not limited to, the following:

- facilities reporting to the NPRI for the first time;
- facilities using improved estimation methodologies;
- changes in facility infrastructure and processes/operations; and
- use of pollution prevention techniques.

Table 3-1 Twenty-five NPRI Pollutants Transferred Off Site in the Largest Quantities for Recycling and Energy Recovery in 2001

		Off-site Transfers for Recycling and Energy Recovery (tonnes)													
CAS No.	Pollutant	Energy Recovery	Solvents	Organics	Metals	Inorganics	Acids or bases	Catalysts	Abate-ment Residues	Used Oil	Other	2000 Total	2001 Total	Change 2000–2001)	% change 2000–2001)
7783-06-4	Hydrogen sulphide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	900 794.0	900 794.2	928 928.5	-28 134.3	3.0
7664-93-9	Sulphuric acid	0.0	0.0	0.0	178.4	0.1	6 3345.7	10 448.0	0.0	0.0	1 781.0	75 753.2	41 181.1	34 572.0	84.0
NA	Copper (and its compounds)	0.7	0.0	0.0	36 795.1	372.2	0.0	0.0	24.7	0.0	1 549.1	38 741.9	36 599.5	2 142.4	5.9
NA	Zinc (and its compounds)	51.2	0.0	10.9	35 466.9	885.2	0.0	11.4	520.1	1.3	1 281.1	38 228.2	35 594.9	2 633.4	7.4
NA	Chromium (and its compounds)	0.0	0.0	5.9	11 703.0	47.7	0.0	0.0	6.2	0.0	272.5	12 035.4	7 544.9	4 490.5	59.5
NA	Manganese (and its compounds)	2.4	0.0	27.2	10 484.1	502.5	0.0	0.0	97.8	0.0	639.2	11 753.3	13 673.8	-1 920.5	-14.0
NA	Lead (and its compounds)	6.1	0.0	0.0	9 656.6	9.5	0.0	0.0	9.7	0.0	135.5	9 817.4	13 708.6	-3 891.2	-28.4
1330-20-7	Xylene (mixed isomers)	2 960.8	4 013.5	40.2	0.0	0.0	0.0	0.0	0.0	0.4	34.4	7 049.3	11 989.7	-4 940.3	-41.2
NA	Nickel (and its compounds)	77.0	0.0	5.8	4 655.9	4.6	0.0	204.1	5.4	0.0	141.2	5 094.0	4 766.2	327.8	6.9
108-88-3	Toluene	2 316.6	2 631.8	20.3	0.0	0.0	0.0	0.0	0.0	0.1	29.5	4 998.3	7 840.6	-2 842.3	-36.3
7429-90-5	Aluminum (fume or dust)	0.0	0.0	0.0	3 133.1	0.0	0.0	0.0	0.0	0.0	319.4	3 452.5	2 836.3	616.2	21.7
107-21-1	Ethylene glycol	134.2	23.2	2 966.9	0.0	0.2	0.0	0.0	0.0	0.6	232.6	3 357.6	7 229.9	-3 872.3	-53.6
78-93-3	Methyl ethyl ketone	797.2	2 419.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.8	3 217.2	4 100.5	-883.3	-21.5
7647-01-0	Hydrochloric acid	0.0	0.0	0.0	0.0	59.6	244.1	0.0	0.0	0.0	929.9	1 233.6	1 365.3	-131.8	-9.7
NA	Ammonia (total)	0.0	0.0	0.0	6.7	148.7	0.0	14.7	161.8	0.0	831.0	1 163.0	1 345.7	-182.7	-13.6
7440-62-2	Vanadium (and its compounds)	0.0	0.0	1.4	840.1	115.2	0.0	1.6	13.3	0.0	148.3	1 119.9	683.4	436.6	63.9
67-56-1	Methanol	544.6	360.5	107.2	0.0	0.0	0.0	0.0	0.0	0.7	12.7	1 025.8	867.4	158.3	18.3
67-63-0	Isopropyl alcohol	309.9	482.4	11.3	0.0	0.0	0.0	0.0	0.0	0.0	7.6	811.1	1 372.5	-561.4	-40.9
108-10-1	Methyl isobutyl ketone	157.4	468.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	630.0	1 105.0	-475.0	-43.0
100-41-4	Ethylbenzene	270.5	354.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	3.4	629.6	818.1	-188.4	-23.0
1313-27-5	Molybdenum trioxide	0.0	0.0	0.0	245.4	2.6	0.0	323.4	0.0	0.0	0.0	571.4	794.6	-223.3	-28.1
108-95-2	Phenol (and its salts)	0.0	0.0	478.9	0.0	0.0	21.4	0.0	0.0	0.0	9.2	509.6	391.5	118.1	30.2
NA	Arsenic (and its compounds)	0.0	0.0	0.0	430.3	51.4	0.0	0.0	2.0	0.0	12.6	496.2	485.5	10.7	2.2
NA	Antimony (and its compounds)	0.0	0.0	0.0	372.8	1.1	0.0	0.0	0.0	0.0	38.7	412.6	244.7	168.0	68.6
71-36-3	n-Butyl alcohol	193.3	178.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	372.4	392.0	-19.6	-5.0
Largest on-site releases		7 821.8	10 932.2	3 677.3	113 968.4	2 200.8	6 3611.2	11 003.2	841.4	3.1	909 208.4	1 123 267.8	1 125 860.3	-2 592.6	-0.2
National total		8 597.5	11 570.0	3 832.0	114 704.4	2 339.3	6 3617.0	11 086.5	957.0	76.8	909 680.1	1 126 460.6	1 130 372.0	-3 911.4	-0.3
% of national total		91.0	94.5	96.0	99.4	94.1	100.0	99.2	87.9	4.0	99.9	99.7	99.6	0.1	0.1

4 INDUSTRIAL SECTORS TRANSFERRING THE LARGEST QUANTITIES OF NPRI POLLUTANTS OFF SITE FOR RECYCLING AND ENERGY RECOVERY IN 2001

In 2001, the following five industrial sectors reported the largest off-site transfers for recycling and energy recovery, accounting for an estimated 1 028 204 tonnes (91.3% of the total) (see Table 4-1):

- NAICS No. 2131, Support Activities for Mining and Oil and Gas Extraction: 900 975 tonnes (80.0%);
- NAICS No. 3241, Petroleum and Coal Products Manufacturing: 66 835 tonnes (5.9%);
- NAICS No. 3363, Motor Vehicle Parts Manufacturing: 35 948 tonnes (3.2%);
- NAICS No. 2122, Metal Ore Mining: 12 242 tonnes (1.1%); and
- NAICS No. 3314, Non-Ferrous (excluding Aluminum) Production and Processing: 12 203 tonnes (1.1%).

Table 4-1 Industrial Sectors Transferring the Largest Quantities of NPRI-listed Substances Off Site for Recycling and Energy Recovery in 2001

		Off-site Transfers for Recycling and Energy Recovery (tonnes)												
CAS No.	Pollutant	Energy Recovery	Solvents	Organics	Metals	Inorganics	Acids and Bases	Catalysts	Abate-ment Residues	Used Oil	Other	2000 Total	2001 Total	Change (2000–2001)	% change (2000–2001
1. NAICS No. 2131 – Support Activities for Mining and Oil and Gas Extraction:															
7783-06-4	Hydrogen sulphide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	900 794.0	900 794.0	928 928.0	-28 134.0	-3.0
1330-20-7	Xylene (mixed isomers)	29.9	0.0	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	13.2	32.1	243.4
67-56-1	Methanol	42.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.3	18.0	24.3	135.3
110-54-3	n-Hexane	3.6	0.0	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.4	0.9	29.5	3240.2
67-63-0	Isopropyl alcohol	24.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.5	11.2	13.3	118.8
Total all substances in sector		**139.1**	**0.0**	**42.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**900 794.0**	**900 975.4**	**928 988.9**	**-28 013.5**	**-3.0**
2. NAICS No. 3241 – Petroleum and Coal Products Manufacturing:															
7664-93-9	Sulphuric acid	0.0	0.0	0.0	0.0	10 448.0	0.0	55 630.5	0.0	0.0	0.0	66 078.5	28 662.1	37 416.4	130.5
108-95-2	Phenol (and its salts)	0.0	0.0	259.1	0.0	0.0	0.0	21.4	0.0	0.0	8.6	289.1	135.8	153.3	112.9
7440-62-2	Vanadium (and its compounds)	0.0	0.0	1.4	211.7	0.0	0.0	0.0	0.0	0.0	7.5	220.6	181.6	39.0	21.5
NA	Nickel (and its compounds)	0.0	0.0	0.9	90.7	9.1	0.0	0.0	0.0	0.0	10.3	110.9	247.0	-136.0	-55.1
1319-77-3	Cresol (mixed isomers and their salts)	0.0	0.0	47.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.3	82.2	-34.9	-42.4
Total all substances in sector		**0.0**	**0.0**	**317.2**	**354.1**	**10 484.2**	**0.0**	**55 651.9**	**0.0**	**0.3**	**27.0**	**66 834.8**	**29 418.7**	**37 416.1**	**127.2**
3. NAICS No. 3363 – Motor Vehicle Parts Manufacturing:															
NA	Zinc (and its compounds)	0.0	0.0	0.0	17 995.4	0.0	0.0	0.0	0.0	0.0	8.8	18 004.1	15 729.5	2 274.6	14.5
NA	Manganese (and its compounds)	0.0	0.0	17.8	6 269.0	0.0	0.0	0.0	0.6	0.0	7.1	6 294.6	8 208.5	-1 913.8	-23.3
NA	Chromium (and its compounds)	0.0	0.0	5.9	4 402.7	0.0	0.0	0.0	0.0	0.0	1.7	4 410.3	4 259.4	150.9	3.5
NA	Lead (and its compounds)	1.9	0.0	0.0	2 098.4	0.0	0.0	0.0	0.0	0.0	8.5	2 108.9	4 533.8	-2 424.9	-53.5
NA	Nickel (and its compounds)	0.0	0.0	5.0	1 778.4	0.0	0.0	0.0	0.0	0.0	1.4	1 784.7	830.3	954.4	114.9
Total all substances in sector		**87.9**	**986.1**	**28.8**	**34 692.3**	**1.4**	**0.0**	**3.4**	**0.6**	**0.0**	**147.7**	**35 948.3**	**36 627.1**	**-678.8**	**-1.9**

Table 4-1 Industrial Sectors Transferring the Largest Quantities of NPRI-listed Substances Off Site for Recycling and Energy Recovery in 2001

		Off-site Transfers for Recycling and Energy Recovery (tonnes)													
CAS No.	Pollutant	Energy Recovery	Solvents	Organics	Metals	Inorganics	Acids and Bases	Catalysts	Abate-ment Residues	Used Oil	Other	2000 Total	2001 Total	Change (2000–2001)	% change (2000–2001
1. NAICS No. 2131 – Support Activities for Mining and Oil and Gas Extraction:															
7783-06-4	Hydrogen sulphide	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	900 794.0	900 794.0	928 928.0	-28 134.0	-3.0
1330-20-7	Xylene (mixed isomers)	29.9	0.0	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	13.2	32.1	243.4
67-56-1	Methanol	42.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.3	18.0	24.3	135.3
110-54-3	n-Hexane	3.6	0.0	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.4	0.9	29.5	3240.2
67-63-0	Isopropyl alcohol	24.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.5	11.2	13.3	118.8
Total all substances in sector		139.1	0.0	42.2	0.0	0.0	0.0	0.0	0.0	0.0	900 794.0	900 975.4	928 988.9	-28 013.5	-3.0
2. NAICS No. 3241 – Petroleum and Coal Products Manufacturing:															
7664-93-9	Sulphuric acid	0.0	0.0	0.0	0.0	10 448.0	0.0	55 630.5	0.0	0.0	0.0	66 078.5	28 662.1	37 416.4	130.5
108-95-2	Phenol (and its salts)	0.0	0.0	259.1	0.0	0.0	0.0	21.4	0.0	0.0	8.6	289.1	135.8	153.3	112.9
7440-62-2	Vanadium (and its compounds)	0.0	0.0	1.4	211.7	0.0	0.0	0.0	0.0	0.0	7.5	220.6	181.6	39.0	21.5
NA	Nickel (and its compounds)	0.0	0.0	0.9	90.7	9.1	0.0	0.0	0.0	0.0	10.3	110.9	247.0	-136.0	-55.1
1319-77-3	Cresol (mixed isomers and their salts)	0.0	0.0	47.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.3	82.2	-34.9	-42.4
Total all substances in sector		0.0	0.0	317.2	354.1	10 484.2	0.0	55 651.9	0.0	0.3	27.0	66 834.8	29 418.7	37 416.1	127.2
3. NAICS No. 3363 – Motor Vehicle Parts Manufacturing:															
NA	Zinc (and its compounds)	0.0	0.0	0.0	17 995.4	0.0	0.0	0.0	0.0	0.0	8.8	18 004.1	15 729.5	2 274.6	14.5
NA	Manganese (and its compounds)	0.0	0.0	17.8	6 269.0	0.0	0.0	0.0	0.6	0.0	7.1	6 294.6	8 208.5	-1 913.8	-23.3
NA	Chromium (and its compounds)	0.0	0.0	5.9	4 402.7	0.0	0.0	0.0	0.0	0.0	1.7	4 410.3	4 259.4	150.9	3.5
NA	Lead (and its compounds)	1.9	0.0	0.0	2 098.4	0.0	0.0	0.0	0.0	0.0	8.5	2 108.9	4 533.8	-2 424.9	-53.5
NA	Nickel (and its compounds)	0.0	0.0	5.0	1 778.4	0.0	0.0	0.0	0.0	0.0	1.4	1 784.7	830.3	954.4	114.9
Total all substances in sector		87.9	986.1	28.8	34 692.3	1.4	0.0	3.4	0.6	0.0	147.7	35 948.3	36 627.1	-678.8	-1.9

Table 4-1 Industrial Sectors Transferring the Largest Quantities of NPRI-listed Substances Off Site for Recycling and Energy Recovery in 2001 (continued)

		Off-site Transfers for Recycling and Energy Recovery (tonnes)													
CAS No.	Pollutant	Energy Recovery	Solvents	Organics	Metals	Inorganics	Acids and Bases	Catalysts	Abate-ment Residues	Used Oil	Other	2000 Total	2001 Total	Change (2000–2001)	% change (2000–2001
4. NAICS No. 2122 – Metal Ore Mining:															
NA	Copper (and its compounds)	0.0	0.0	0.0	9 606.1	0.0	0.0	0.0	0.0	0.0	0.0	9 606.1	6 924.8	2 681.3	38.7
NA	Lead (and its compounds)	0.0	0.0	0.0	1 661.7	0.0	0.0	0.0	0.0	0.0	0.0	1 661.7	1 928.6	-266.9	-13.8
NA	Zinc (and its compounds)	0.0	0.0	0.0	368.1	0.0	0.0	0.0	0.0	0.0	0.0	368.1	305.9	62.2	20.3
NA	Nickel (and its compounds)	0.0	0.0	0.0	234.9	0.0	0.0	0.0	0.0	0.0	0.0	234.9	415.8	-180.9	-43.5
NA	Cadmium (and its compounds)	0.0	0.0	0.0	138.5	0.0	0.0	0.0	0.0	0.0	0.0	138.5	162.0	-23.6	-14.6
Total all substances in sector		0.0	0.0	0.0	12 199.7	0.0	42.7	0.0	0.0	0.0	0.0	12 242.4	9 923.5	2 318.8	23.4
5. NAICS No. 3314 – Non-Ferrous (Excluding Aluminum) Production and Processing:															
NA	Copper (and its compounds)	0.0	0.0	0.0	7 012.2	0.0	329.1	0.0	0.0	0.0	0.0	7 341.3	7 402.5	-61.2	-0.8
NA	Lead (and its compounds)	0.0	0.0	0.0	1 715.7	0.0	4.1	0.0	0.0	0.0	0.0	1 719.8	1 815.1	-95.3	-5.3
NA	Zinc (and its compounds)	0.0	0.0	0.0	1 529.1	0.0	0.0	0.0	189.0	0.0	0.0	1 718.1	2 087.4	-369.3	-17.7
7664-93-9	Sulphuric acid	0.0	0.0	0.0	175.8	0.0	0.0	277.7	0.0	0.0	0.0	453.5	597.2	-143.8	-24.1
NA	Arsenic (and its compounds)	0.0	0.0	0.0	387.5	0.0	0.0	0.0	0.0	0.0	0.0	387.5	382.0	5.5	1.4
Total all substances in sector		2.4	0.0	16.5	11 383.9	0.0	333.2	277.7	189.0	0.0	0.0	12 202.7	12 878.5	-675.8	-5.2

Table 4-1 Industrial Sectors Transferring the Largest Quantities of NPRI-listed Substances Off Site for Recycling and Energy Recovery in 2001 (continued)

		Off-site Transfers for Recycling and Energy Recovery (tonnes)													
CAS No.	Pollutant	Energy Recovery	Solvents	Organics	Metals	Inorganics	Acids and Bases	Catalysts	Abate-ment Residues	Used Oil	Other	2000 Total	2001 Total	Change (2000–2001)	% change (2000–2001
4. NAICS No. 2122 – Metal Ore Mining:															
NA	Copper (and its compounds)	0.0	0.0	0.0	9 606.1	0.0	0.0	0.0	0.0	0.0	0.0	9 606.1	6 924.8	2 681.3	38.7
NA	Lead (and its compounds)	0.0	0.0	0.0	1 661.7	0.0	0.0	0.0	0.0	0.0	0.0	1 661.7	1 928.6	-266.9	-13.8
NA	Zinc (and its compounds)	0.0	0.0	0.0	368.1	0.0	0.0	0.0	0.0	0.0	0.0	368.1	305.9	62.2	20.3
NA	Nickel (and its compounds)	0.0	0.0	0.0	234.9	0.0	0.0	0.0	0.0	0.0	0.0	234.9	415.8	-180.9	-43.5
NA	Cadmium (and its compounds)	0.0	0.0	0.0	138.5	0.0	0.0	0.0	0.0	0.0	0.0	138.5	162.0	-23.6	-14.6
Total all substances in sector		**0.0**	**0.0**	**0.0**	**12 199.7**	**0.0**	**42.7**	**0.0**	**0.0**	**0.0**	**0.0**	**12 242.4**	**9 923.5**	**2 318.8**	**23.4**
5. NAICS No. 3314 – Non-Ferrous (Excluding Aluminum) Production and Processing:															
NA	Copper (and its compounds)	0.0	0.0	0.0	7 012.2	0.0	329.1	0.0	0.0	0.0	0.0	7 341.3	7 402.5	-61.2	-0.8
NA	Lead (and its compounds)	0.0	0.0	0.0	1 715.7	0.0	4.1	0.0	0.0	0.0	0.0	1 719.8	1 815.1	-95.3	-5.3
NA	Zinc (and its compounds)	0.0	0.0	0.0	1 529.1	0.0	0.0	0.0	189.0	0.0	0.0	1 718.1	2 087.4	-369.3	-17.7
7664-93-9	Sulphuric acid	0.0	0.0	0.0	175.8	0.0	0.0	277.7	0.0	0.0	0.0	453.5	597.2	-143.8	-24.1
NA	Arsenic (and its compounds)	0.0	0.0	0.0	387.5	0.0	0.0	0.0	0.0	0.0	0.0	387.5	382.0	5.5	1.4
Total all substances in sector		**2.4**	**0.0**	**16.5**	**11 383.9**	**0.0**	**333.2**	**277.7**	**189.0**	**0.0**	**0.0**	**12 202.7**	**12 878.5**	**-675.8**	**-5.2**

5 BIBLIOGRAPHY

5.1 Government References

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Environment Canada. *Notice with Respect to Substances in the National Pollutant Release Inventory for 2000*. Extract, *Canada Gazette*, Part I, December 25, 1999.

Environment Canada. *Notice with Respect to Substances in the National Pollutant Release Inventory for 2000* — Amendment. Extract, *Canada Gazette*, Part I , December 23, 2000.

Environment Canada. *Supplementary Guide for Reporting to the National Pollutant Release Inventory — Alternate Thresholds — 2000*. Minister of Public Works and Government Services Canada, Ottawa, 2000.

Government of Canada. *Canadian Environmental Protection Act, 1999*. Statutes of Canada 1999. Chapter 33. Act assented to 14 September 1999.

Statistics Canada. *North American Industry Classification System (NAICS) Canada Manual — 1997*. Catalogue 12-501-XPE, Ottawa, 1998.

Statistics Canada. *Standard Industrial Classification — 1980*. Catalogue 12-501E, Standards Division, Ottawa, 1989.

5.2 Web Site References for Substance Information

A. Environment Canada

- The Green Lane:
  www.ec.gc.ca/envhome.html
- National Pollutant Release Inventory On-line Data Search:
  www.ec.gc.ca/npri/
- CEPA Environmental Registry:
  www.ec.gc.ca/CEPARegistry/
- New and Existing Substances:
  www.ec.gc.ca/substances/
- List of Toxic Substances (Schedule 1 of CEPA 1999):
  www.ec.gc.ca/CEPARegistry/subs_list/Toxicupdate.cfm

B. Health Canada

- Existing Substances Division:
  www.hc-sc.gc.ca/hecs-sesc/exsd/index.htm

C. International Links

- Agency for Toxic Substances and Disease Registry (ATSDR):
  www.atsdr.cdc.gov/
- Chemfinder:
  chemfinder.cambridgesoft.com/
- Environmental Defense Scorecard:
  www.scorecard.org/
- International Agency for Research on Cancer (IARC):
  www.iarc.fr/
- International Programme on Chemical Safety (IPCS):
  www.inchem.org/
- National Toxicology Program (NTP):
  ntp-server.niehs.nih.gov/
- Organisation for Economic Co-operation and Development (OECD):
  www.oecd.org/home/
- United Nations Environment Programme (UNEP):
  www.unep.org/
- World Health Organization:
  www.who.int/dsa/cat97/zehc2.html

5.3 Additional Sources of Information

Agency for Toxic Substances and Disease Registry (ATSDR)
1600 Clifton Road (E29)
Atlanta, GA 30333
U.S.A.
Tel.: (404) 639-6300
Fax: (404) 639-6315
Web site: **www.atsdr.cdc.gov/**

Canadian Centre for Occupational Health and Safety
Chemical Evaluation Search and Retrieval System (CESARS)
250 Main Street East
Hamilton, ON
L8N 1H6
Tel.: (905) 570-8094
Fax: (905) 572-2206
Web site:
www.ccohs.ca/products/databases/cesars.html

Commission for Environmental Cooperation (CEC)
393 St. Jacques Street West
Suite 200
Montréal, QC
H2Y 1N9
Tel.: (514) 350-4300
Fax: (514) 350-4314
Web site: **www.cec.org**

Health Canada
Publishing Coordinator
Environmental Health Centre
Tunney's Pasture 0801B3
Ottawa, ON
K1A 0L2
Tel.: (613) 957-3143
Fax: (613) 941-8632
Web site: **www.hc-sc.gc.ca**

International Agency for Research on Cancer (IARC)
150 cours Albert Thomas
F-69372 Lyon cedex 08
France
Tel.: +33 (0)4 72 73 84 85
Fax: +33 (0)4 72 73 85 75
Web site: **www.iarc.fr/**

National Library of Medicine (TOXNET)
8600 Rockville Park, Bldg. 38A
Bethesda, MD 20894
U.S.A.
Tel.: (301) 496-6531
Fax: (301) 480-3537
Web site: **www.nlm.nih.gov/hinfo.html**

APPENDIX A — **RELEASES AND TRANSFERS DEFINED BY NPRI**

On-site Releases:

An on-site release is a discharge of an NPRI-listed pollutant to the environment, within the physical boundaries of the facility. This includes:

- emissions to air — discharges through a stack, vent, or other point release, losses from storage and handling of materials, fugitive emissions, spills and accidental releases, and other non-point releases;
- releases to surface waters — discharges, spills, and leaks, but not including discharges to municipal wastewater treatment plants (which are reported under off-site transfers for treatment); and
- releases to land — spills, leaks, and other.

Final Disposal Activities — On Site and Off Site:

The following activities or operations are included in the category classified as "final disposal" — on site and off site:

- containment — two forms of containment are identified:

  i) landfill; and

  ii) other storage;
- underground injection;
- land treatment — for the purpose of land application or land farming; and
- off-site final disposal for storage.

Off-site Transfers for Treatment Prior to Final Disposal:

A shipment of an NPRI-listed substance may be transferred to an off-site location for treatment prior to final disposal. The treatment processes include:

- physical treatment (e.g., drying, evaporation, encapsulation, or vitrification);
- chemical treatment (e.g., precipitation, stabilization, or neutralization);
- biological treatment (e.g., bio-oxidation);
- incineration or thermal treatment where energy is not recovered; and
- treatment at a municipal sewage treatment plant.

Off-site Transfers for Recycling and Energy Recovery:

A shipment of an NPRI-listed substance may be transferred to an off-site location for recycling and energy recovery. "Recycling" refers to activities that keep a material or a component of the material from becoming a waste destined for final disposal. Nine types of recycling operations are identified:

- recovery of solvents;
- recovery of organic substances (other than solvents);
- recovery of metals and metal compounds;
- recovery of inorganic materials (other than metals);
- recovery of acids and bases;
- recovery of catalysts;
- recovery of pollution abatement residues;
- refining or reuse of used oil; and
- other recovery, reuse, or recycling activities.

An NPRI substance may be sent for energy recovery when the substance or the material containing it has sufficient energy content (BTU value) to allow its use as an alternative to fossil fuels or other forms of energy.

The printing processes used in producing this document conform to environmental performance standards established by the Government of Canada under Canada's *National Guidelines on Lithographic Printing Services*. These standards aim to ensure the environmental integrity of printing processes through reductions in toxic emissions to the environment, reductions in loading of wastewater, reductions in the quantity of material sent to landfills, and the implementation of resource conservation procedures.

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National Pollutant Release Inventory

Canadian Environmental Protection Act, 1999